



Issue 5, May/Jun 2003

#### Dr. Boy

Is it Sega ? is it a Game Boy ?  
NO !!! Its Dr. Boy the cheap console.

**Celebrating**  
**QL 1983-2003**  
**20 Years**

A black and white photograph of a vintage QL keyboard and a QL console unit. The keyboard is a full-sized, dark-colored unit with many keys. The console unit is a small, dark-colored device with a screen and buttons. They are positioned diagonally across the center of the page, with the text "Celebrating QL 1983-2003 20 Years" overlaid on them.

#### Wolfgang Haller

The CO of SPC Köln awnsers our  
questions on another great  
Retro Review Interview.

**APE**  
**Atari Periferal Emulator**  
All the things you could wish to  
connect to your ATARI on  
a single software package.

**ARCADE COLLECTING GUIDE**  
A guide to arcade collecting.  
Introducing you to the world of  
arcade games, by Robert  
Hazelby, a retro review subscriber

Retro Review Issue 5 \_ ONLINE VERSION

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# Index

## Regulars:

Editorial	Page 5
News	Page 6
Subscription Page	Page 21
Past Issues	Page 40



## Arcade Collecting

Page 8

## Sinclair QL

Page 13



## Retro Gamer

Page 17



## **Dr. Boy Console**

**Page 19**



## **Wolfgang Haller**

**Page 22**



## **Atari Peripheral Emulator**

**Page 27**

## **Emulator Writing**

**Page 30**



## **VGA BOX**

**Page 34**

**Page 35**

An Interview with:

**YAREK ADAMSKI**

# EDITORIAL

OK, this time we did it we actually spent almost a year without releasing a Retro Review Issue, got to admit it it takes art to do something like this... So, what happened ? Well there really is not much of a excuse for it, but as you know Retro Review Magazine is an Hobby, and a much loved one, that we dedicate much time and effort, but unfortunately both I and Ian cant give Retro Review as much attention as we wanted to.

Unfortunately Ian as been much to busy to pay his usual contribution to our project, as an effect of that most of this issue was wrote and proof read by myself, and, in consequence of my far from perfect english the magazine will be full of errors and grammar failures, sorry ...

In this issues cover you'll find the QL computer as a feature, we picked the 20th anniversary of the computer as a topic, hope you like the article.

A new Retro Magazine is on the stands, her name is Retro Gamer, I wish them the best of luck (and i believe Ian also does) and ask from you all the support you can give them, its hard to keep a magazine running, specially on topic with little relevance as retro computing.

This issue is smaller than usual as a consequence of the short time we have for it, but as a compensation to our readers we will make issue 6 bigger.

A Big special thanks to Robert Hazelby for the fantastic arcade collecting article

he wrote for Retro Review, to Wolfgang Haller for baring with us on this issues interview and to Yarek Adamski the dude who is building YABUS a interface for the ZX Spectrum, read more about it on this issue.

Now for a question we received many times on our e-mail :

Will Retro Review cease to exist ?

Sure, but not soon ! As with all things we believe we are not eternal , but you may count with Retro Review for many issues and years to come, so dont be afraid, when you least expect, Retro Review will arrive at your door, always late to keep you on your toes :). Now really we are sorry for the long time you had to wait for this issue, 2003 was a bad year for Retro Review..

Another thing that looks like it arrived into a stall is Peters PPlus, we've got news that Alex went to another company and that they are short on money to produce the new boards, all the mails we sent to Peters Plus got no awnser from them. Lets hope for the best, signs are that this is about to get sorted out but the only thing we've heard have been rumors.

Next Issue, number 6 will bear a CDROM for subscribers, containing all issues of Retro Review in PDF format, would you like to see something else on it ? just mail us your ideas.



# News



## Retro Gamer Magazine on the bench

According to them Retro Gamer magazine is the first UK's retro regular magazine.. It is great to have a Professional looking Retro mag the mag is 100 pages long, A4, full colour, great looking, next issue we will do a in depth review of it, for now, i can tell you it looks good on the outside, the CD ROM is a must have. In Portugal it costs 7 Euro and according to the cover it costs 5.99 GBP in the UK. See the review on this very issue !!!

## The Spectrum ROM Disassembly

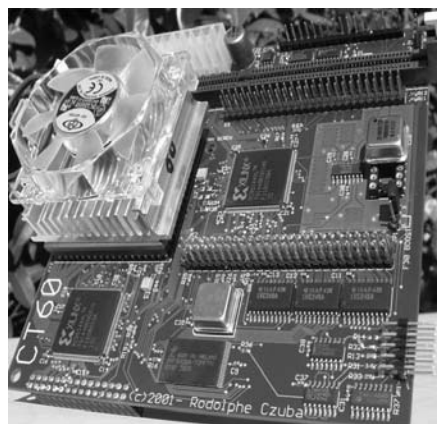
Probably one of the most sought after books in the ZX Spectrum market, the Spectrum Rom Dissassembly is now available online. A Great Contribution from a list of persons too big to put in here but available on their page. If you dont own one, get this now IT IS A MUST !

go to : <http://freestuff.grok.co.uk/rom-dis>

## More CT-60 being made for your Atari Falcon

Czuba Tech will be producing more of their Falcon 030 acceletaror boards, as it reads on [atari.org](http://atari.org), they will be producing another 42 units, check them out at :

<http://www.czuba-tech.com>





## Classic Tech Letter changed ownership

Michael Nadeau's previous editor of Classic Tech e-letter (remember the guy with the orange retrocomputing book) gave his work to Evan Klobentz, here is an excerpt of what he said to us.

More of interest to you, I'm also starting a weekly email newsletter, titled "Computer Collector" (<http://news.computercollector.com>). This is the newsletter that formerly was called the Classic Tech E-Letter and was run by former Byte editor Michael Nadeau. Mike, Sellam Ismail, and others will be writing for my newsletter.

I don't plan to have a print version, nor do I plan to charge a subscription fee. So far I only have two issues out (the past two Mondays), which I can forward to you if you're interested.

I'm trying to keep the Computer Collector E-Mail Newsletter publishing on a weekly basis. Mike didn't do that with the original Classic Tech E-Letter, which is one reason he gave me the responsibility. I have no comment about the color of his book. :)

Evan

## Got News ?

If you know something new or want the world to know it Please send us your news to [news@retroreview.com](mailto:news@retroreview.com) or write us to:

Jorge Canelhas  
Retro Review Magazine  
Apartado 3115  
2745 QUELUZ  
PORTUGAL

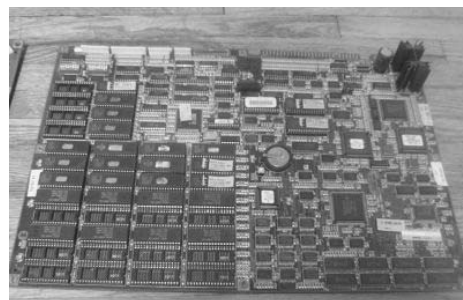


# Arcade Collecting

**Retro Review subscriber Robert Hazelby takes a walk down memory lane, revealing just how easy it is to get into arcade collecting and re-living those days gone by. Not technically minded? No problem. All you need is a passion for arcade preservation and a love for retro gaming at its very best.**

Remember all those classic games you used to play as a kid? Perhaps you spent many a happy hour (and a whole pile of ten-pees) blasting your way through wave after wave of Space Invaders, maze after maze of Pac Man, or you can still hum all three in-game tracks to Sega's racer 'Out Run'.

Many of you probably haven't played those titles in years, or if you have, the games have probably been running on MAME (Multiple Arcade Machine Emulator). Wouldn't it be great to re-live those days of yesteryear where you were down the seaside with your folks, the sun was beating down, and you were stuck in some dark and gloomy arcade having the time of your life? Yes, you can do this with MAME, but instead of playing with a PC keyboard and staring at a computer monitor wouldn't it be great to play the games how they were intended by using the original arcade hardware and in the comfort of your own home? Sounds unrealistic? Well, read on. You may be surprised at just how easy it is to recreate that misspent youth of yours.



Mortal Kombat 3 Jamma Board  
thanks to [www.hanaho.com](http://www.hanaho.com)

Before I continue I'd better explain that this article is aimed at complete arcade collecting novices. I won't be going into any in-depth technical details, wiring diagrams and the like. All I'm assuming is that you've got a small bit of common sense and a big passion for retro arcade games. So, for those of you already hoarding a nice collection of machines and PCBs go off and make yourself a cup of tea and come back when we've finished.

Right, where were we?

Ok, so you've decided that you'd like to adopt an arcade machine and make a home for it in your pad. Now, before you buy your first machine please make sure that your wife/girlfriend/parents (depending on your situation) are fully supportive in your new hobby. I've read a fair few postings on newsgroups where the arcade cab-hating wife/girlfriend has

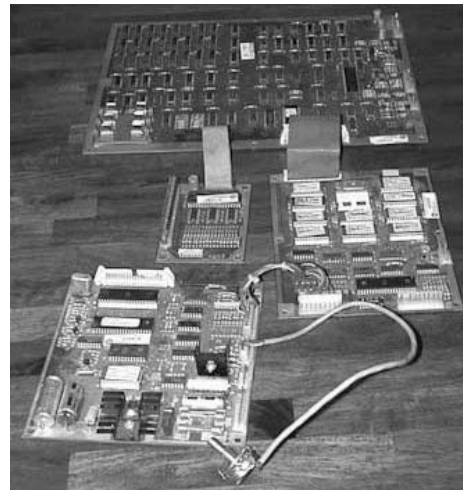
either walked out (that's fine as you'll have no problems adding to your collection once she's gone!), sold the machine while the husband wasn't there, or worst of all, attacked the machine with something nasty (a sad tale of a super glue massacre was one horror story I read!)

The above may sound rather far-fetched, but I can assure you it's not. It may have been a while since you last laid eyes on an arcade machine. The majority of them are not small, require a fair bit of floor space, are extremely heavy, and sometimes have problems going through doors. So, make sure you're 'allowed' a machine in the house and you have somewhere for it to go. OK? Now it's time to go shopping...

It will probably come as no surprise to you that Ebay is probably THE place to look

you're after. Do you want one specific arcade machine to play a much-loved retro title, or would you prefer to have one machine that can play a variety of titles? Confused? Read on.

At its most basic there are really two types of games; ones that can run on most arcade cabinets and ones that can only work using the original hardware they were designed to run on. For example, Atari's 1979 classic 'Asteroids' required a Vector monitor to display its graphics. This



Defender boards and title screen thanks  
to  
Chad Gray

<http://www.chads.aqrcade.btinternet.co.uk>



when starting out on this hobby. Not only does it give you a good idea of what the 'going rate' is for these games, but it's also a lot cheaper than buying from dedicated retro arcade stores.

Point your browser over to the arcade section of EBAY UK, sit back and drool at all those lovely games for sale that you used to play as a kid. Now, before you jump in and bid on everything listed in the hope of recreating those heady days of 80's arcade gaming think about what it is

means that you can't just plug an 'Asteroids' into a normal Raster (like your TV) display monitor, as it will not work. So, if you wanted an Asteroids machine, then really the only games you could play on that would be 'Asteroids' and 'Asteroids' deluxe. Likewise, if you wanted to play Out Run you would really need the original cabinet, complete with steering wheel, breaks, gas peddle etc. Games like this are known as 'dedicated', meaning that they require dedicated hardware to run.





Seeing as this article is aimed at the complete arcade collecting novice we'll stick to simpler things, and assume that what you're after is a machine that can play a variety of games. In that case, you'll want what's known as a JAMMA cab. JAMMA is a type of connector that allows quick and easy swapping of other JAMMA game boards in and out of your cabinet. The majority of games released since 1986 (when the standard was first devised) are JAMMA, and many pre 1986 titles can be converted to the JAMMA format with connectors that you can also pick up on Ebay.

A decent condition JAMMA cabinet can be picked up on EBAY for between £100 and £120 and that's usually with a game, meaning you can start playing straight away. I would recommend that you go for a machine that has at least 3 buttons per player, and at least two joysticks. A quick monitor size warning is probably due at this point. It's worth noting that a typical cabinet with a 21" (or greater) monitor will not fit through a typical front door. Patio doors or taking your machine apart are really the only answers here! Now that you've bought your cabinet, you'll want to buy a few games to play in your new toy. Find a few titles that interest you and then point your browser over to KLOV - The Killer List of Video Games.

KLOV is a fantastic online resource for arcade collectors. Here you can easily look up the games you're interested in, and find out some vital information about them. The most important thing to find out about the game you are after is "Is it JAMMA?". Using KLOV you can find this out with a few simple mouse clicks. Once you've stumbled on the page dedicated to the game you're after you'll see a whole host of snippets of info listed after the 'Manufacturer' details. The most important thing here is 'Conversion Class'. If it says JAMMA then you're almost there, as it means that you can plug this game straight into your new

JAMMA cab. Other items of importance here are the 'Monitor Type' (make sure this says 'Standard' unless you know you have a medium resolution monitor) and 'Orientation'. Most games play with the screen set horizontally, but some games (mostly shoot-em-ups and classics) play vertically. As you're a novice when it comes to arcade collecting I would recommend at this stage you only go for games that display at the same orientation as your monitor. You can worry about going for different orientations once you've found your feet. We don't want you faffing around with your hands in the backs of arcade monitors just yet, as the voltages stored in certain monitor components can contain enough charge to kill you even after the power has been turned-off!

Ok, so you've got your machine home, positioned it where you want it. You've powered the machine up and the volume is either non-existent or its blasting your ear drums like there's no tomorrow. Don't panic. Simply open up your cabinet so you can get to your game PCB while the game is on and hunt around for a volume dial on the board. Give this a twiddle and you should be able to get the volume to a level you want. Don't panic about getting an electric shock from your game PCB, it's only powered by 12 volts and I've yet to receive any kind of electric shock from doing this.

Some newer game boards do not have a volume control on the PCB itself, but instead have it displayed on an options screen.

So, the game is up and running, the sound is at the level you want, but the game is either too difficult/easy etc. This is where 'dip-switches' come in to play. Do you remember the times when you went into an arcade, played your favourite game and struggled to get anywhere on it? Then, a few weeks/months down the line you found your favourite game in a different arcade and you could get miles

into the game? Unfortunately it's likely that it wasn't down to a sudden increase in games-playing prowess, but more to do with the fact that the dip-switches were set differently, meaning the difficulty level was altered. The dip-switches on an arcade PCB usually come on two banks/rows of eight switches which can be set to either 'on' or 'off'. When you buy an arcade PCB it's unlikely that you'll receive any dip-switch documentation with your new purchase, and this is where SPIES/WIRETAP comes in. This place is dedicated to storing arcade PCB schematics (circuit diagrams), board pin-outs (useful for converting non JAMMA games to JAMMA) and dip-switch settings. Find the dip-switch settings for the game you own, change the game to play how you want it, and you're all set for hours of classic retro gaming in the comfort of your own home. Coin mechanisms may also be fitted to your cabinet and can usually accept new coinage, but dip switches on the game PCB can usually be adjusted to allow 'free play' meaning that you now have the ultimate games console.

After reading the above perhaps you've now decided you'd like to get into this arcade game collecting 'lark', but just don't have the space to house an arcade cabinet. Fear not, all is not lost. A 'Supergun' could be just what you're after. No, I'm not on about some kind of Iraqi weapon of mass destruction, but rather a small box that sits under your TV and lets you play arcade games on your TV. Why it's called that I just don't know. All you need to know is that it's a great way to get into arcade collecting before you decide if you want to fill your place up with hulking great arcade cabinets.

A Supergun is basically a small box that houses a power supply, and lets you connect a couple of joysticks and an arcade PCB, all to your television. These can be picked-up on EBAY from anywhere between £80 - £120 (depending on the

build quality). If you're a dab hand with the soldering iron you could make one yourself (full instructions are on the CPS 2 Shock site). On the other hand, you may feel more comfortable buying a ready-made Supergun from a shop. The build quality will usually be higher than those selling on Ebay, and it will be fully guaranteed. Be warned though, you'll pay more for this privilege. There are two main companies in the UK selling Superguns, Raven Games and Arcade Heaven. You'll be looking at paying around £170 to buy a Supergun from these stockists. I don't know what the quality of the Arcade Heaven Superguns are like, but have been using a Raven Games system for a good 3 or 4 years and its still working fine. One thing I will say at this point is do not buy arcade PCB's from these stockists.



Super Gun , allows you to test your jamma boards.

The prices are very expensive, and you'll find the same titles on EBAY for much less. Just make sure that the PCB is listed as 'fully tested/working' as an 'untested' board usually means 'un-working'. Once you've started your retro arcade collecting, you'll no doubt want to speak to likeminded people, and the best way for European arcade collectors to do this is via the UKVAC (United Kingdom Video Arcade Collectors) mailing list. There are



literally hundreds of arcade enthusiasts subscribed, many with an in-depth knowledge of the collecting and restoring scene. I would like to say at this point that if you do subscribe to the list please wait a few days to get a feel of the place before posting your questions. Also, make use of the UKVAC archive search facility. It's very powerful, and you may find that your question has already been mentioned in the past. There's nothing that will annoy a long-time UKVAC subscriber more than questions that have already been covered a thousand times before. Hopefully this short article has given you some idea if arcade game collecting is for you. If you do decide to join the arcade collecting scene be warned that it is VERY addictive indeed! You may soon find that you'll be buying PCB's and cabs left, right and centre, and free space in your house becoming a thing of the past.

Whatever happens, enjoy your own personal trip down memory lane.  
Best of luck!

Robert Hazelby

Many thanks go to fellow arcade collector Gary Smith for his time spent proof-reading and additions to the above article.

### **Glossary:**

DIP-SWITCH: Found on arcade PCBs and used for altering difficulty, coins per credit, attract sound etc.

JAMMA: (Japan Amusement Machinery Manufacturers Association). A type of `connector` standard for arcade PCB's. If you have a JAMMA cabinet, then you can plug any JAMMA compatible game into your machine just like you would do with a game cartridge.

MAME: Multiple Arcade Machine Emulator. Play classic arcade games on your PC.

MONITOR: Raster (same display as a TV monitor), Vector (creates screen images using lines. High resolution but low detail)

PCB: (Printed Circuit Board). This is the actual game, and you'll see the word mentioned on most forums and web sites.

SUPERGUN/JAMMA TEST RIG: Small box of tricks allowing you to play arcade PCBs on your TV. Make sure your TV has a SCART connector. Most modern ones do.

### **Resources:**

Arcade Heaven: Arcade Supergun stockists.

<http://www.arcadeheaven.co.uk/>

The Arcade Machines Section of Ebay UK:

<http://listings.ebay.co.uk/aw/plistings/list/category575/index.html>

KLOV (Killer List of Videogames): Get your game information here.

<http://www.klov.com>

SPIES/WIRETAP: Dip-switch settings, PCB schematics and more.

<http://www.spies.com/~arcade/>

UKVAC: Official Site for the United Kingdom Video Arcade Collectors list.

<http://www.ukvac.com/>

CPS 2 Shock: Want to build you own Supergun? Instructions here.

<http://cps2shock.retrogames.com/jamma.html>

Raven Games: Arcade Supergun stockists.

[www.ravengames.co.uk](http://www.ravengames.co.uk)

VAPS: Video Arcade Preservation Society. Catalogue your arcade collection online.

# Sinclair

Released 20 years ago, the sinclair QL remained for years one of the most advanced machines in the microcomputer arena. We didnt knew if we should comemorate the 20 years in 2003 ( commemorating the date when the QL was made) or 2004 (commemorating its release in jan 1984) well due to time restraints we ended up commemorating in 2004 but still left the cover with the 2003 mention on it.

# QL



Loved by some, ignored by others, the QL was born to be Sinclair's golden child, unfortunately it simply didnt cut it, from a controversial and buggy beginning to a quick withdrawn of support by its makes the QL seemed to be doomed at birth, lets head back to 1983 at the launching of the machine, that very moment the project manager simply left Sinclair claiming that his expectations were defrauded, in an interview to a spanish magazine 'Microhobby' , we will get to this latter in a boxout, first for the ones who just arrived from mars during this august's oposition, let me introduce the Sinclair QL.

The Sinclair QL is based on the motorola 68008 microprocessor a cut down version of the almighty 68000, internally they are pretty much the same, externally however the 68008 only has a 8 bit data bus and isonly able to address 1MB of memory, the Sinclair QL has the good looks of the ZX Spectrum + (or better, the ZX Spectrum + has the look of the QL) with 2 built in microdrives, each one capable of holding up to 100kB of info inside a cart, the Sinclair QL has 128kB of memory

(base), for I/O the QL provides 2 Serial Ports, 2 Network (ZX network) ports, an RGB output, a connector that allows you to hook up to 6 more microdrives and a CPU slot that allow you to put another CPU board onto it so you can have a faster processor and more memory, many of the available CPU board also include some sort of disk interface due to the know unreliability of microdrives, the QL has good display power, it allows you to output 8 different colors, the sound isnt much of a killer, the QL only has a beeper :) .

Software wise the QL ships with Super Basic a powerful (yet buggy in earlier versions) basic interpreter, the QL handles pretty much everything has channels, the screen for example is divided into 3 channels (if you are on monitor mode) one is for inputting the basic listing the other display it and the 3rd one show s the results of the program (I'm really over simplifying everything for space reasons). the QL also supports multitasking and has a complete disk operating system built in.

Another Big Point On QL Software is the superb application package it contains you get no less than a Word Processor, a Spreadsheet, a Business graphics



package and a Database, their names vary from the english version for the US version, but their abilities are the same, so when you bought the QL you just needed a printer and a monitor and your business was ready to roll on your QL, what more could you ask for ? Well a good user guide ? YOU GOT IT, the QL as simply one of the best user guides ive seen on any home computer (though the QL wasnt really marketed as simply an home computer it was price tagged as one).

unfortunately the QL besides being packed with good stuff came also packed with bugs, it was so buggy that Sinclair provided a ROM cart to iron out these bugs.

Being such a good machine brought the QL a great deal of supporters, and being such a buggy machine gave the QL a good source of 3rd party developers, the most famous QL expansions were probably the Miracle Systems cards, the Trump Card a Ram Expansion card that boosted the QL a further 768 KB and a Disk Drive interface, the Gold Card, a 16MHz 68000 and an amazing 2 MB of further RAM and a Disk Drive Interface supporting 2.88 MB as well as standard Densities Floppy disks, and the Super Gold Card that provided a 68020 CPU and 4MB of ram and not one but 2 disk ports each supporting 2 disk drives. Another rather cool expansion , better yet Upgrade, is the Aurora Mainboard, this board replaces you QL board and gives better better screen modes in addition to other stuff. A good QL cant live without a mouse, so i'de recommend the QIMI mouse interface.

## QL SPECS

Processor:	Motorola 68008
ROM:	48 KB
RAM:	128 KB
Graphics:	256*256*8 colors 512*256*16 colors
Storage Media:	2 100K Microdrive
Sound :	Beeper
IO:	2 Serial 2 Joystick RGB TV Out 2 ZX Network CPU Slot ROM Cart slot Microdrive slot
Keyboard:	65 Keys Full action Keyb.
Soft (ROM)	QDOS Superbasic
Soft (Bundled):	Quill Abacus Archive Easel

Since we spoke of Miracle systems is good to remember that these dudes made the QXL Isa PC card, actually a ISA QL Computer, you can get stuff like this on Q Branch, see the 'still supporting' box.

Softwarewise the QL is still very active, but in contrast with the Amiga, QL Software is Paid, and well paid indeed, well anyway, you can get great text editors and Spreadsheet progs, there are plenty of utils for the QL, but, as you could expect, most of the latest utilities and programs are made for the latest QLs, so be careful to check if your system is up to the task, check Text87



Above:

A Pic of the QL's Back, notice the serial and controller connectors that are like the BT phone lines, maybe good for UK people but for the rest of europe they SUCK, this unit also has a QIMI mouse interface (see the gray ribbon coming out of the ser2 port and a Supertoolkit ROM cart. The QL also (as all other Sinclair home machines) lacks the ON/OFF button.

and QSpread programs, they look cool.

Another way of running QL software is to Emulate, there are several emulators out there, the most famous is QPC2 it features smsq OS from start and you can get it from <http://www.quilgus.net>, the emulator like most of QL stuff is



QPC demo, very nice looking indeed, petty for the price.

EXPENSIVE, to get the full version you must pay 99 Euro, if you want a free one you can look for QLAY2 a freeware QL Emulator, this however is for DOS and Windows 95 and wont run on a W2K machine, the is a Windows 2000 and XP version but according to their website, it cant be distributed due to legal rights, com guys the machine wont make you rich, is sad to see a machine loosing potential 'customers' because of legalities over a 20 year old machine.

Another good alternative is uQLx, a freeware emulator for Unix, Windows and Mac OSX, their site is <http://dokos-gr.net/ql/uqlx.html>. For Amiga users, check aminet for QDOS4Amiga a very good package..

Clones..

The Sinclair had several clones both in the UK and Overseas, the most well knows is the 'ICD One Per Desk' (in the photo on the right side of the page) it was a all in one office system, others

as the Tonto were available overseas.

The Sinclair QL is still alive and kicking, its not a fervorous community like Amigans but they are there and developing, as for collectors value, the QL is a pretty good machine to have, as always look for a boxed unit with the super comprehensive Manual

**Jorge Canelhas**



## Still supporting....

**Q\_Branch -**

<http://www.qbranch.demon.co.uk>  
QL Shop and distributors of QL Today, a sinclair QL Magazine.

**Q U A N T A**

<http://www.quanta.org.uk>  
Independent QL Users Group  
This club has been around for 19 years, give a peek.

**Jochen Merz Software -**

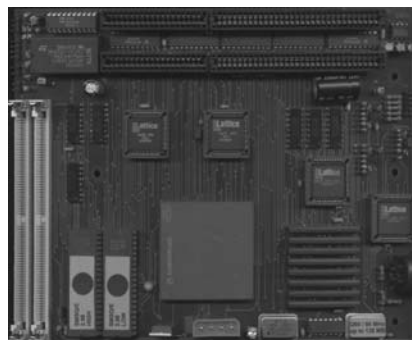
<http://smsq.j-m-s.com>  
A Active QL Software Producer, a must visit site, these are the producers of SMSQ Operating system.

# Q60 Today's QL ?

Featuring a processor that would envy many Amigas and Ataris the Q60 is the latest incarnation of a QL machine, the specs of this machine gives us an idea of how dead the QL is or IS NOT !!!

Q60 is a QL machine built around the Motorola 68060 microprocessor, lets say this machine is to the QL as the Sprinter is to the ZX Spectrum, but even more than that...

This baby features: 66MHz 060 CPU, up to 128 MB RAM, Hi speed 32bit graphics modes in addition to the QLs original modes, Stereo Sound, Hard Disk and CDROM controllers in addition to Floppy disk controllers, runs QDOS, SMSQ/E and Q60 Linux. If you are deep into the QL this is the machine to get, you can get it at <http://www.q40.de> whit that you'll buy a Q60 Board that you can put in your own AT case, just as with the sprinter, the price, however isnt that nice , the latest prices ive seen were 545 GBP for a complete tower assembly with a 060 running at 60 MHZ, you'll have to dosh out another 138 Quid for the 66



MHz version , the disk controller and IO card is another 14 Pounds and the software another 60, oh did i forgot , another 10 Quid for the ROMs. Though this might look expensive, bear in mind that you can do all sorts of upgrades to your classic QL and you'll never achieve the same performance and you'll probably spent little less than this.

## What went wrong ?

We dug out an old Microhobby magazine that came with a interview with Tony Tebby, in this interview, that supposedly Tony didnt let the reporters take his photo he said that he was defrauded with the machine that the QL turned out to be. In his words (or better yet , to what microhobby says to be his words) the QL was to be a Portable computer, Printer, Monitor included. After giving this interview Tony Tebby went on a project of is own that was the QLT a pseudonim for Quality, well never heard of it, maybe it want that successful after all, if you know anything more about this subject please contact us we are curious how this story turned out .

A great place to search for sinclair QL in spanish is: <http://www.speccy.org/QL> to whom we thank for the magazine scan on the right

**ENTREVISTA**

**HABLAMOS CON UNO DE LOS PADRES DEL QL**

Después de una larga espera, el QL ha llegado a su destino. En esta entrevista, uno de los padres del QL, Tony Tebby, nos cuenta cómo fue el desarrollo de esta máquina y qué planes tiene para el futuro.

**TONY TEBBY PREPARA EL NUEVO QL**

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# Retro Gamer Magazine

Walking in the shopping center near my favorite newsstand i glimpsed a ZX80 and a Spectrum in a cover of a magazine, the first thing that came to my mind was that it was just another empty article on another empty IT magazine, written by executives who just know about trends a little of computing. I was wrong, it WAS a professionally printed Retro Magazine, those ATARI style letters and that old joystick drawing couldnt be wrong. i just had to buy it...

Finally after years of waiting a full professional printed Retro Magazine

Retro Gamer MAGazine comes in a classy glossy paper , a little bigger than A4 size, and 116 pages of full color Retro contents.

Issue #1 features an article about ... Right the Sinclair line of computers, after all this IS a british magazine, what would you expect. Anyway, according to the title this is more of a retro games magazine, than a all round retro and retro novelties mag, and it sticks to its name , really good graphism can be found all over the mag, and to round it up there is a delightful CDROM, believe me this CD ROM is a MUST ! you just gotta have it, it brings 75 Emulators (although not the latest versions) you know that compilation you keep say you are going to do but always forget, this emulator bonanza also allows you to take a peek at machines that you didnt really looked before. Interesting features of Issue 1 are both the Sinclair History, and



Retro GAmr #1 in all glory :), notice the funny worn out corners, it almost took me to the news agent again before i noticed they are fake !!!





the mastertronic article. In the cover you can also find a TOP 100 games, 10 games for each of 10 platforms in fact, nice feature too. Issue two comes in a pure white cover with the same old joystick logo, features are the history of commodores (much in the same way of the previous number's Sinclair history) and for me the best of issue 2, the oliver twins interview (yup the dudes from the dizzy series). Oh both mags include a old time commercials section. in the end.

What do i think of the magazine? Its looks great , looks better than it reads, there is plenty of empty space in the mag, 2 pages of colors and a title are quite common there. Ide give it a 4 out of 5 not because of the empty spaces, but from the fact that it barely brings anything to the scene other than nostalgia, there seems to be a lack of new old things, such as new stuff analyzes and the likes. But , no question can be made, this IS a very good magazine, that i will defenatively recommend !!!

*Jorge Canelhas*



## Where to Get it.

You can buy Retro Gamer on any good newsstand (at least in Portugal) or you can order it calling the number

**01625 850565**

**Thats a UK number so if outside dial + 44**

**Issue 3 is planned to 15th april**

Pure old Family fun or...

# Dr. Boy

By Jorge Canelhas

I was browsing at a chinese store and i glanced just another one of those tetris clone portable machines usually known as BrickMania or whatever you wish to call it, when a pink one caught my attention...

To be honest it wasnt the console itself that caught my attention but the weird 'whatever to gameboy' converter you can see on the top of the pic, what in the world was that ? a NES to GB converter ? Nahhh, then i analyzed the hand held game next to it and whoooooaaa a brickmania with Composite output and a joystick connection, what in the world...

So I got the console for 6 euro, the cart with 999999999 games for 2 euro the pistol and converter for another 3 and went home to see what i got.

The main switch has 3 positions, off , TV and LCD, the LCD is just another of those brick games with other variants on it but nothing fancy, it suposelly has dozens of games but they are all the same, tetris, arkanoid (and a very punny one in fact), a game that tries to look like a car game and another that i didnt figured it out just yet, now for the intersting part, i connected it to the composite input on my tv plugged in the pistol, inserted the cart and turned it on, a screen with a list of games appeared, the first was super mario, this looks interesting, did nintendo receive anything for this ? the game itself isnt bad, but is really behind a the true NES game and why ? simple this machine is a family game console, family game consoles are pretty popular in chinese shops over here and they represent a very good value for money, the prime



reason may be the total disrespect for copyright issues, but hey don't shoot the messenger I'm just reviewing it ;=).

Most of the games are exactly the same but in different levels, don't expect 10 different super mario's its all the same game. The game that caught must of my attention was 'DUCK HUNT' a shoot the duck game, very funny indeed, your objective is to kill duck with a pistol, yes it is true it comes with a light gun and



all, but continue reading in the next section...

Now for the peripherals, the stuff was all spread in a exposition table when i first got it but later when i returned to get one for a friend of mine, I called the shop keeper he told me about a box that he thrown away, i quickly told him that i wanted the box too and they i saw it all in one, the Real pack is: Dr.boy, Pistol, 99999999 in 1 cart, Family game adapter and a nifty hand controller, copied from the playstation design, c'mon don't these guys have any imagination of their own.

Well all in all you get a bunch of cool stuff for around 10 Euro, it will amuse you for at least a day, the FIFA game is way cool too and the pistol enabled games can be really fun to play with friend, if you get it for this price buy it.

Just to give it a quick note, considering the amount of extras, and specially the price, i will rate it with a round,

# 85%

*Jorge Canelhas*

On the left column from top to bottom:

- The intro menu that you get when you power it on.
- FIFASOCCER 2000 - cool but slow game.
- SUPER MARIO - a clone....
- CLAY SHOOT - Pistol enabled game, keep shooting the dishes, attention the precision of the light gun is bad to say the least, but remember that you get what you pay for.

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You know this pages header ? if so great, otherwise shame on you you are missing one of the best and last ZX Spectrum and SAM magazines, Wolfgang agreed to talk to us a little so lets hear what he has to say...

Hi, Wolfgang, welcome to Retro Review Interview !

Hello Jorge. First like me say thank you for making it possible to have a room here for the SPC. This is the club, my heart is hanging on since January 1990, when I took it over from my predecessor.

Me, that is Wolfgang Haller, but less people know me under my real name. In the "scene" I am better known as the "Wo" part of the WoMoTeam, the "Mo" part at this time was Monika. We have both started to run this club before it was vanished. Until 2001 we was a Team, since November 2002 we are divorced. But this is another point. The sad side effect was that I needed a new apartment and with this I had not the

place as before. So only my SAM Coupé is in work, as it emulates Spectrum and ZX81 too (from harddisk and CD-ROM). But with a new development from Holland, a ZX<>PC interface I hope to solve this place problem on my disk, as this interface connects a Spectrum with the PC devices as disk, harddisk or CD to use the PC as slave (the only real use for a PC :)), not needing a diskdrive or taperecorder anymore.

See pic on the lower left

Here you see my equipment on the desktop. Left a Spectrum 128K with Plus D interface and two diskdrives, in the mid a SAM Coupé (with harddisk, and in the box Quazar soundcard, Mouse IF and Comms IF) and to the right an 133 Mhz 486 PC.

Whenever I can I went to Spectrum parties. I like the feeling to be under friends with the same hobby, changing experiences or playing games. It is as with a big family. The next meeting is ours from the SPC in connection with our dutch partners from the HCC Sinclair-gg in Stein/Urmaond (Holland) at 26./27. April 2003. Here two pics from our last meeting:



Wolfgang's old desktop

The meeting is still a good place for people who are looking for soft- and hardware, but also a good place for asking with repairs or programming tips. As you can see I was not happy, when the party has ended.

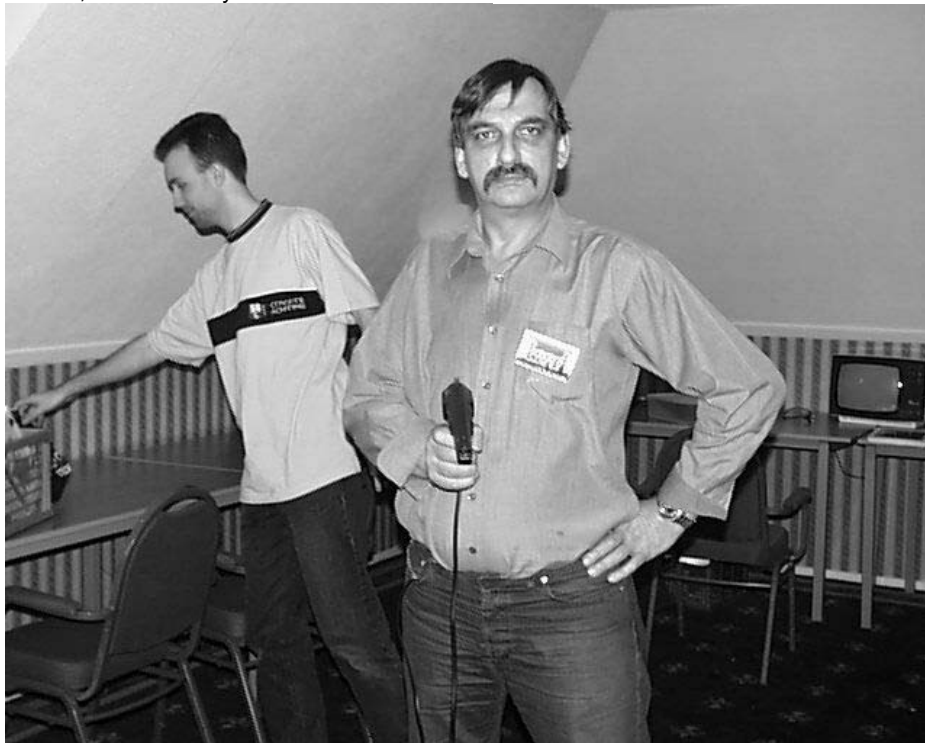
### 1) Why the Spectrum, from all machines over there why did you choose the spectrum ?

To be honest by an error :). I have to go back to the year 1980/1981. At this time I started to study by an evening school after work, so I had a lot of handwriting to do. I was unsuspected with Computers at this time, the only thing I knew was a computer as a comfortable text writing system. However, any computer in this years was to expensive for me, until the day I saw an advert of



Urmond Selling hardware.

the Sinclair ZX81. A day which changed my whole live! By a price equivalent about 150 Euro nowadays I saw a fine method to help me with my school writings - not knowing what 1 KB ment. To make a long story short: In 1981 I bought a ZX81 and learned the Basic. I



Wolfgang in the end of a meeting (Editors note - you can robe someone with a gun like that and that mustache !!!)



never forget me sitting before our TV, typing in programs from magazines (which was available as sand at the sea) and get them running. I learned to program simple games in 1 KB, but very fast I saw, that the ZX81 was not preferred to write long texts, so in the same year a 16 KB memory extension and a keyboard module (which sat on the original one) was the next buy. However, this keyboard module was the dead of my ZX81 one year later.

But I was in the computing fever. So it was logical for me, to "upgrade" to a ZX Spectrum and - learned from the ZX81, direct with 48 KB. Within the years I had further "upgraded" to Spectrum 128 KB, +2, +2A, + 2A/B, but never to the +3 (don't ask me why, is was not the trendiest model in Germany). 1994 I owned my first SAM Coupé, which I had swopped for an Atari 1040 ST!

In all those years I had several computers in my home, the most based on Z80 processor, but even if it was a Commodore, Tandy, Schneider, Atari, Amiga or a Sinclair QL, no-one has had the "charme" of a Spectrum (except the SAM Coupe).

In the first years I meet a lot of people with our first club meetings, and a lot of them have not a Spectrum anymore, but are still friends. It was and is the best computer community.

## **2) Tell us about SPC, how was it born, when, members activities...**

The exactly date of the club foundation is not known to me, but it was in the first quarter of 1984. This was the high time of Sinclair Computers and a lot of clubs was born in the years from 1982 on (I saw a lot of them come and the most also went off the scene very fast). This early club supplied ZX81, Spectrum and Microdrive. In 1986 I become a legal member to the club, which has change

its leader in between.

With the first diskdrives (Opus in my case) I started to get contacts to other users via the club magazin, but the main time the mag was badly copied and not very good to read. As it comes to the decision end of 1989 to let the club die, I couldn't agree and started to take them over. In January 1990 the wondering local Spectrum world saw my first magazin.

So as you can see I run this club in its 13th year now, and in 1990 a lot of Spectrum users saw the Spectrum as a nearly dead computer amongst PC, MAC, Atari and so on. My predecessor had named the club as "Rainbow User", associated to the rainbow logo on the computer itself. I never liked that name, also I didn't used a rainbow, I used a Spectrum and so in 1991 the club name was changed to "Spectrum Profi Club" (SPC) and extended later to "Spectrum and SAM Profi Club" with the introduction of MGTs SAM Coupé.

It was my predecessor who started with the first (and his last) club meeting in a hall near the Cologne main railway station. It was an experience I never forget. Amongst PC and Atari users we had a stand and the first Spectrum 128K was playing the sound of Tetris through the echoing hall! Since then we had regularly meetings once a year and hopefully twice in 2003.

Such a club can only exist by the activities of the members. This is mostly a repair service and the exchange of experiences via the regular club magazin (since 2001 bi-monthly), also helping in organize the meetings. The best meeting we ever had was in 1997, it was called the "Century meeting" from several sides as not less then five leaders from several clubs was coming.

From left to right: LCD (Austrian



Spectrum Club), Joachim Merkl (ZX-Team), Wolfgang Haller (Spectrum & SAM Profi Club), Thomas Eberle (SUC and Sintech) and Johan Koning (Sinclair-gg Holland). I am sure no-one knows, that Thomas Eberle is also SPC member, and he was before he started his own clun and Sintech.

### 3) How many members does SPC have ? And from what countries ?

I started 1990 with 73 members, which was not that lot, but remember, there was other clubs and my predecessor was not very interested with his members and the club magazin. Also the club was not international orientated. One year later we had 97 members and in our best year 1993 there was 144 from Germany, Netherland, Suisse and Austria. Since then the number of members is regressive and for 2003 I see not more than about 60 members. Once started as a real german club we have now members from Austria, Denmark, England, Netherland, Poland, Portugal, Sweden and some of the GUS. I suppose we have more magazin readers as members ;-)

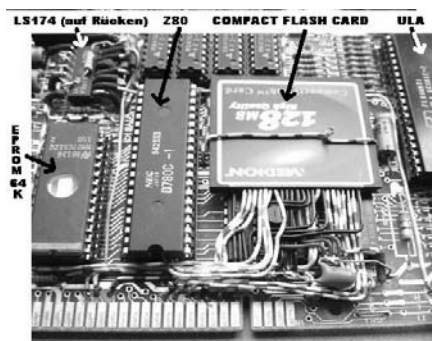
### 4) What services does SPC provide ? Helpdesk ? Repair ?

Yes, all of them. The SPC was always a club with a helpful hand and I try to do my best to answer questions via email, letters or magazin. In case I can't help I give the problem further to the members. I am happy to say, that after a period of about 4 years (by death or left the scene completely) we again have a repair service on demand.

We also have still members who develops hardware (for Spectrum and SAM, and some times for the good old Zeddy). One of the last piece of hardware is a ZX<>PC interface (a dutch development), which connects the Spectrum to a PC and makes it to that what a PC should be: a slave. The interface allows access to the PC harddisk (or any other PC device) so you can load your Spectrum programs from there straight forward into the Spectrum. And actual there is a way to get an inbuild flash card with 128 MB running with a Spectrum as a mass memory (also from the Netherlands). The same is done with the SAM Coupé in England by our partner Colin Piggot ( [www.quazar.clara.net/sam/](http://www.quazar.clara.net/sam/) ).

### 5) Do you have any comments to do about retro review ?

Yes. I am glad to see another people acting with retro computing. The less users we are, the closer we should



Flashcard on Speccy





stand together. It is a logical consequence in a world of "Windows". Also the SPC has an open ear to get together with other clubs and mags, supporting elder systems. And and if everything works well we have our first common clubmeeting with the Joyce User AG ( [www.joyce-ag.de](http://www.joyce-ag.de) ) in October. Erm - yes, I own a Joyce too... it has a Z80 inside :).

I hope that "Retro Review" will continue over a long period and I like to see that the Spectrum is a strong component there. I like this magazin very much, as it is also well done in its layout.

from its members and a subscription last for a year from January on. You got 6 issues per year with a content of 36 pages A5. The mag has german and english articles. In case of problems we try to help in any way. If anybody is interested then visit our website:

[www.womoteam.de](http://www.womoteam.de) or for the SAM [www.womoteam.de/SAM](http://www.womoteam.de/SAM)

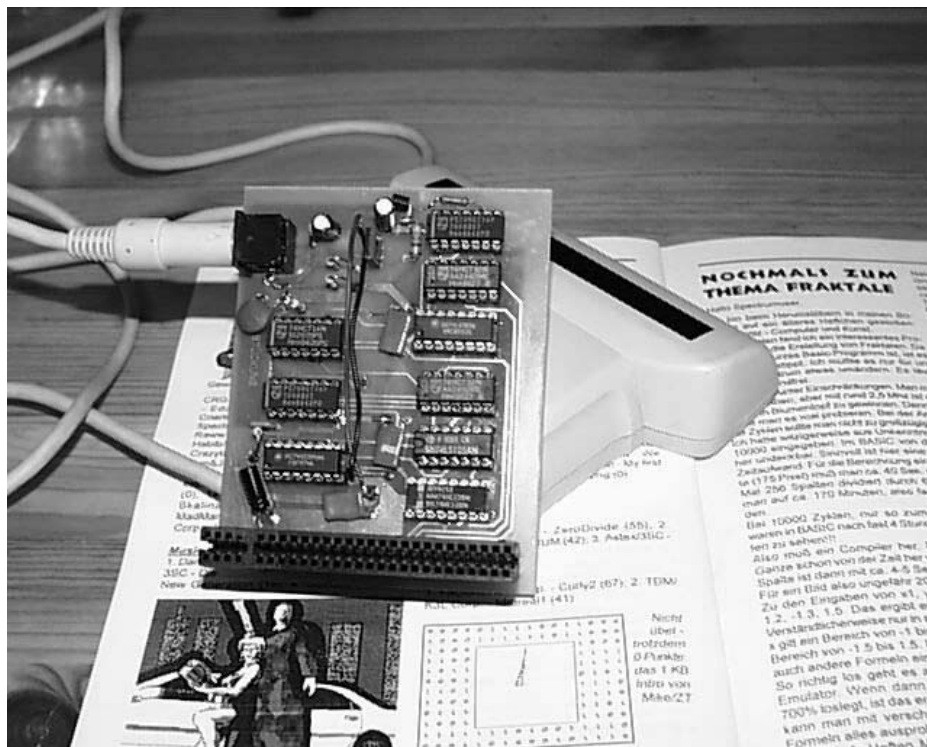
Keep the Speccy alive!

Best wishes

Wolfgang Haller (Wo from WoMo-Team)  
[womoteam@t-online.de](mailto:womoteam@t-online.de)

#### 6) Do you want to leave a statement for postriority ?

A bit of advertisement. The SPC lives



A Handscanner on a ZX Spectrum, projects like this can be found on SPC magazine

## Your Atari will go Monkey with

# A.P.E.

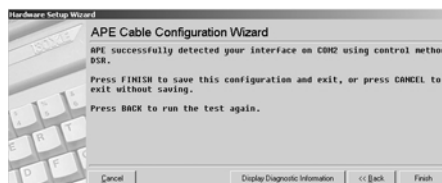
## Atari Peripheral Emulator

what's APE, plain and simply the Atari Peripheral Emulator, this software combined with a SIO2PC type of cable will bring your ATARI to worlds never experienced by your 8 bitter before, Jorge Canelhas makes this review for you to get to know APE.

Many Atarians keep on the look for Disk Drives for their systems, many come across a few on ebay usually sold as is, why ? well the 1050 drives weren't that reliable indeed and with almost 20 years on their back they aren't really the thing you'd like to give warranty on, believe me i dont blame the sellers on that, when you find the newer XF drives you'll see them too highly priced, if you want to recover old software from your own disks, there isnt much of a choice but to buy a new drive, but if you want a disk drive and don't need to recover disks thats where APE comes in, remember issue 2 where i did a review on SIO2PC and Atari 800 Disk drive emulators ?, they were good, no i believe they were excellent due to their price, now , add a printer, modem and cassette emulation , throw in another bunch of cool goodies and you got APE.

APE comes as a Setup EXE, when it sets up you can run it right away, if you are not a registered user you'll wait a little on a nag screen and then are presented with several options, the wizard lets you configure your cable assle free, its amazing, plug the cable in the PC and Atari and follow the instructions, in less than a minute you are running, now lets see what APE has to offer us...

Drive Emulation, you can use a big

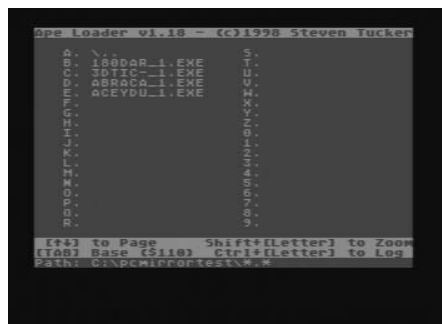


Ape Wizard successfully detected my sio2pc cable.

bunch of disk types, just by opening the ATR file creator you are presented with the standard Atari 810 and 1050 disks, the Indus GT and Percom disks too and customizable disks that way you can make a Hard Drive up to 16 MB for use with Sparta DOS that comes included as an ATR image.

The drives can run up to 3x SIO Speed, loading anything is a breeze.

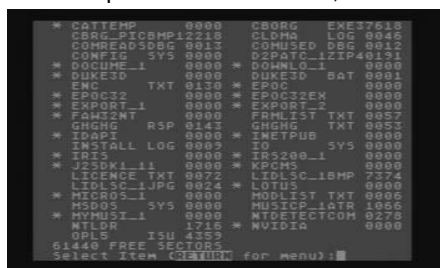
Then still in the drive department, you get a so called PC mirror, wich is one of the coolest things I've seen on any retro computer, give drive 1 a pc mirror path



The PC Mirror on APELOADER



(actually any path on your Hard Drive) then start the atari with Option pressed so it wont load the ROM, wait on the lag screen and Voila, the pc directory you gave, you can run any binary file from here, its not only cool but very useful, I've noticed one possible bug here, sometimes when you are browsing your pc and you hit the ../ to go up dir it just stays on the same directory, thats something to iron out i believe. Other Way to use the PC Mirror is with MyDOS, also supplied on atr image, simply put the mydos disk on drive 1, the pc mirror on the 2nd drive and you can use this OS to work your files, if you are running an unregistred version you can not put stuff on the PC, thats the



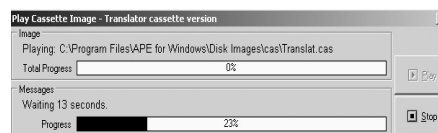
MyDOS displaying my PC hard disk

price for not paying :). Enough for drives, now lets get to the modem part, APE simulates a modem on your atari, it has 2 work methods, either as a receiver or as a caller, you can run your own atari BBS on your 8 bit machine and APE very easily. Another very cool feature is the internet modem, you can use a terminal program



to telnet whatever location you want, i tested 2 locations, amigazone.com and selva.no\_ip.com on port 9999 the first worked almost allways fine and the second returned errors, it started to display the drive info or something, maybe a problem in terminal emulation, i really don't know. Running a simple BBS is simple too. just put you modem in listen mode and run the bbs software supplied as an atr image.

Now for printing, you can redirect the printer to your pc printer whatever model it is, i tried text pro with a HP deskjet 710c and it printed just fine, considere this as a Text only printer because special codes on atari software

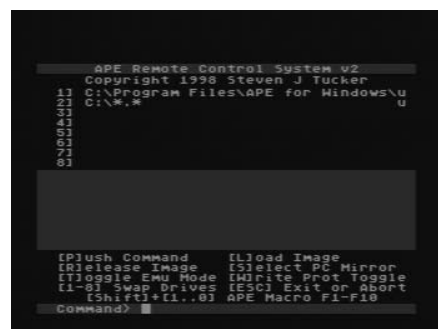


The Cassete interface

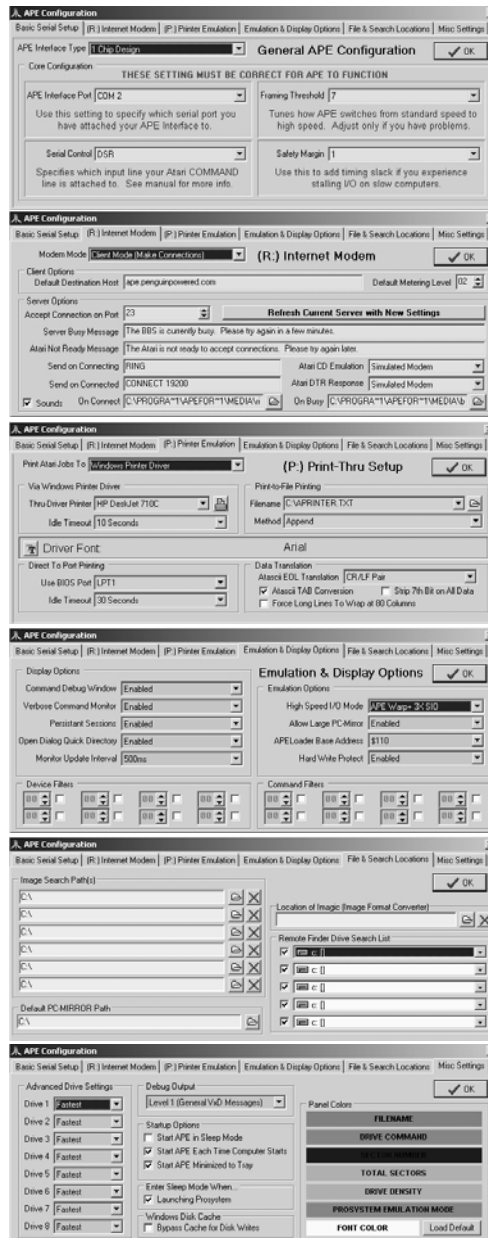
probably wont work on the pc printer. Anyway the printer interface is very configurable, you can set timeouts, the font to use etc.

APE also comes with Cassete emulation, allowing you to play CAS files to your atari, its a simple prepare the atari and click on play to load stuff, cant tell why you want to use it, but it may prove usefull.

There are some goodies thrown with the pack too, you'll get 2 CDs with APE (off course) and 600MB of public domain



Controlling APE through the Atari



Above:  
The several configuration tabs for APE, if you use the wizard you probably wont need to configure anything, but its allways good to know that you are in control of your system and that auto settings can be overridden.

stuff to keep you entertained for years\_ a good utility that is on sparta disks is REMOTE allowing you to perform basic disk swaps and mounts from the atari, that way you wont have to touch the microsoft plagued evil PC and work with your pretty little atari.

Little more needs to be said, through the review I've been in contact with Steven Tucker who couldnt be more helpfull, when you register you'll get full support from the author of APE.

Ape can be found at:

[HTTP://WWW.ATARIMAX.COM](http://www.atarimax.com)

there you can download the trial version and register if you are interested in the product.

To wrap it all up:

APE is a good mature package, i believe you wont need any atari peripheral anymore except for say salvaging old disks, it offers plenty of options and runs troublefree on the PC end, it just stays on the tray and you wont notice it, Its priced at 49.99 USD for the Windows NT and 98 versions, i believe the price is fair considering what you'll get in exchange, there is also a DOS version priced at 39.99 wich i havent seen, if many people demand it we will review it.

I can sleep with a clear conscience

95%

Retro Review  
RECOMMENDED

rating it:

The only flaws i found were at the PC mirror and on the terminal with some BBSs

*Jorge Canelhas*



# ***D.I.Y. Emulation***

## Part 3 - Input and Output

***The final part of emulating a computer is as important as any other part - no good having a machine you can't talk to. To finish our crash course in the emulator fundamentals, here's a quick guide to the machine I/O....***

So far we have a 'computer' that can do funky things like display (C)1982 Sinclair Research Ltd., but what about when we need to do the really heavy stuff, like typing in 10 PRINT "HI"? This is where the input and output side of the machine comes into use.

### ***Two very different animals...***

There are two types of processor, the I/O mapped processors like the Z80 and the x86, and then the memory mapped type like the 6502 and 680x0. The latter type are the simplest, just read the byte at a particular location to input a byte, write to it if you wish to output the byte. For instance, the Atari 2600 runs completely using memory addresses, so to cause the vertical blank signal you

STA VSYNC

which means STore the Accumulator into the memory location VSYNC (it's a define to make it more readable). The Z80 has no such equivalent, though, to talk to peripherals you need two instructions: IN and OUT. As the memory addressing mode is pretty self-explanatory, and as we're looking at the Z80 anyway so far in this tutorial, we'll take a closer look at these instructions. Note there are other instructions, but these are the simplest.

### ***IN, OUT, but don't shake it all about....***

The usual instruction here is IN A,(C) which means grab a byte from the port BC (yes, really BC not just C!) and stuff it into the Accumulator. Equally, OUT (C),A does exactly the opposite.

Let's take a nice simple example of this being used.... you can't get much simpler than a Spectrum 48K's sound capability. On the bottom of the Speccy motherboard is the piezo buzzer - this is controlled directly using bit 4 of the port #FE. Note that this doesn't necessarily mean the port has to be #00FE, but simply that the lower byte has to be #FE. A lot of the Spectrum 48K's ports don't care what the B value is. So, to make the buzzer expand:

LD A, \$10

LD BC, \$FFFE ; FFFE is the usual port  
OUT (C),A

then to make it contract do the same but with A holding \$00. Remember, though, this isn't a tone it's producing, it's just expanding or contracting. To create a tone the program must oscillate at the right frequency, but we don't need to worry about that. All we need to worry about is how the speaker translates to our code.

## Turning an OUT into sound

So now we know how the sound is created, how do we make sound ourselves? If we're on a machine with a similarly primitive speaker system, like an IBM-compatible PC, we can just toggle the PC's speaker. Otherwise, we need to create a sound wave. Doing this is really beyond the scope of this, but what I can say is this - a high bit on the speaker port translates to a value of 255 on an unsigned 8-bit PCM wave, a low bit is 0. This is usually quite a harsh sound, though, so it might be better to use a value such as 32 instead of 255 - Your mileage may vary...

The best way to create sound usually is to make a looping sample and alter the contents of the buffer just before that bit is played. This is hard to explain without being completely system-specific, but basically:

```
Create a looped sound buffer
Play the sample
Update the buffer according to the
buzzer state (stored from the last OUT
#FE instruction).
```

To minimise latency, the byte that's being updated by the OUT instruction must be updated *just before* the host computer reaches that byte in the sound stream. In other words, if the host

computer has reached byte 128 of the sound buffer, update byte 128+16 or so. Depending on the speed of the computer you may be able to modify the byte directly before it is played and eliminate latency, but this needs precise timing!

## Need INPUT!

The Spectrum takes its keyboard input from its favourite port, port #FE. However, in this case, the higher byte is definitely not unused. Reading #FEFE reads the bottom line from CAPS SHIFT to V, the number line 6 to 0 is read using #EAFE (check out the FAQ on [worldofspectrum.org](http://worldofspectrum.org) for other combinations!).

It needs to be remembered that when reading data like this a 1 means the key is *not* pressed! In other words:

```
LD BC, $FEFE
IN A,(C)
```

will load A with \$FE if the Caps Shift key is pressed, \$EF if V is pressed, or \$EE if both. If nothing is pressed, A holds \$FF.

## Saving and Loading....

Also on port #FE (could it be anywhere else?) are the MIC and EAR ports. Output a high bit 3 (i.e. \$08) to port #FE and the MIC socket is set low, output a

### Peripheral or not..?

On the computers like the Spectrum 128K, the most common use for the OUT instruction is probably the bank-switching. Because the Z80 can only access 64K at a time (16K of which is ROM), there is a bank-switching chip in the machine which is accessed using port #7FFD. Using this, any of the 8 16K RAM banks can be switched into the memory location \$C000-\$FFFF, and either ROM (128K or standard 48K ROM) can be switched into \$0000-\$3FFF.

The Spectrum +3 is a more complicated beast, with no less than 4 ROM banks and a more versatile configuration allowing the coder to map the RAM into the usual ROM space \$0000-\$3FFF!



low bit 3 and the socket is set high. So a program will save by oscillating this bit at a frequency that will be recorded by the cassette deck. Equally it can load by reading (via the IN instruction) bit 6 of this port. A real cassette deck will play back the audio signal which effectively just oscillates this bit.

So how do we translate a bit into a byte? First, we need to understand little more about the pattern produced by a saving Speccy. As a side note - port #FE also controls the border colour - this is toggled with each pulse, which gives the stripey effect as it is being toggled while the TV beam is moving down the screen.

The tape signal is first recognised by a pilot pulse of length 2168 cycles. This means that every 2168 cycles, the bit will toggle. There are then two synchronisation pulses, length 667 and 735 cycles respectively, and the data then follows as a series of cycles, each of two pulses of length 855 for a 0, or 1710 for a 1. In other words, to store the byte A (\$41), the tape contains, for example, pulses of length:

2168 (repeated many times)

667, 735 (synch)

and then cycles of length:

855,1710,855,855,855,855,1710

Remember each cycle is two pulses.

So, to represent this to the virtual computer, say we start with a high state. We should toggle this low, then 2168 cycles later, we toggle it high again. Then 2168 we repeat it again. The Spectrum usually does this 8064 times for a header tone. Now we need to wait 667 cycles and toggle it again, then wait 735 cycles and toggle it again. Now we're synchronised, we start the data. The 'A' has a first bit of 0, so we do a 0 cycle, which is made of two pulses each of 855 cycles. We therefore wait 855 cycles, toggle, wait another 855 cycles then toggle again, and the computer has loaded a 0! Internally, the Spectrum

ROM here shifts the accumulator left by one and waits for the next bit. So, A holds \$00. Next, we need a 1, so we wait 1710 more cycles, toggle, wait 1710 cycles again and toggle again. Internally A now holds \$01, so the ROM shifts it left again. Here comes another zero (wait 855, toggle, wait 855, toggle), ROM shifts A left to hold \$02. This is repeated for as long as necessary - after 8 bits, A is stored in the memory and then cleared, and the next byte starts.

Saving is done in exactly the same way, but in reverse - we have to read the toggled bit, and create a byte ourselves from that bit, essentially doing the same as the Spectrum ROM does. From this data we can create .TAP files, or .TZX files. Very handy for games like Lords of Chaos which require loading and saving!

### **Other devices....**

So what about more complex devices?

The Spectrum +3 has three processors, the Z80A, the AY-3-8912 (the sound chip) and the PD-765A (the disk drive controller). All of these processors are handled in the same kind of way, though, using IN and OUT to ports. In fact if you have a Multiface that uses the same system, IN and OUT, to page its memory in and out.

The difficulty of other devices is synchronisation. The AY-3-8192 usually runs at 1MHz in a Spectrum, so it needs to be updated every 3.5 Spectrum cycles, more or less. The AY chip is updated by writing to port #FFFD and #BFFD. It contains a number of registers which control what the four sound channels are doing - so to change register 3 to the value \$FF:

```
LD A, $03
LD BC, $FFFD
OUT (C), A
LD A, $FF
LD BC, $BFFD
OUT (C), A
```



Notice how port FFFD controls the register to be modified, BFFD controls the value. Using this method, each sound channel can be controlled directly. The register can be read too, using IN on port FFFD (note, not BFFD as you might expect!)

The more complex processor is definitely the disk drive. The PD-765A processor understands a set of instructions much like the CPU, and also has its own set of registers. A detailed description is too much for this article, but can be found by reading the datasheet for the processor. Essentially, you should write an instruction such as READ by OUTing the opcode for READ to port #3FFD, followed by the parameters for the read instruction, each outputted sequentially to port #3FFD. When the instruction sequence is completed, the 'disk drive' will go off and do its thing and eventually set a flag to say it's ready, at which point reading using IN on port #3FFD will load the data.

### ***So that about wraps it up...***

Understand all that? No? Not surprising, computers aren't simple, but most of the information you need is right here, and what you don't have can be grabbed off the net on sites like worldofspectrum.org. The purpose of this series has been to show what goes on in an emulator and to explain the

basics from which with a bit of work you can extrapolate how to do many more things. It's not easy to understand at first but when you realise it's all just a matter of bits and timing you can do anything in software that the hardware does.

Here's wishing anybody taking the challenge the best of luck, and best of all, enjoy tinkering with emulator writing!

*Ian Gledhill*

P.S. if anyone writes an emulator, we'd love to see it - if it's not working quite right maybe we can help.

#### ***Important places to visit on the Web...***

[www.worldofspectrum.org](http://www.worldofspectrum.org)

You must have looked here by now!

[www.bulba.at.kz/main\\_e.htm](http://www.bulba.at.kz/main_e.htm)

Nice AY-3-8912 info!

[www.breezer.demon.co.uk/spec/tech/ay-3-8912.html](http://www.breezer.demon.co.uk/spec/tech/ay-3-8912.html)

[www.andercheran.aiind.upv.es/~amstrad](http://www.andercheran.aiind.upv.es/~amstrad)

Info on the PD765A chip and disk formats!





# Logic 3 VGA BOX

Who, among us collectors can say that he has a clean desk ? I hardly know anyone, unless you have more than one desk, cables, monitors and so on seem to breed on our desks, Logic 3's VGA box can give us all an hand on that matter, after all is just a question of space.

As most of you do, i from time to time seem to run out of space on my desk, the primary culprights are the 3 monitors, 1 VGA for the Amiga and the PC, and 2 simple composite ones for whatever machines i put on the desk, when i saw this device i promised to myself i would put the 2 extra monitors in the closet and use the VGA monitor solely and that way id get some extra room in my desk, well that wasnt exactly what happended but ill get to that latter. The VGA Box is a stylish black box with 2 buttons, 6 leds and a bunch of connectors in the back, the operation is simple, you have 4 composite and 1 vga input and a vga output, at a flick of a switch you go from 1 input to the other, the composite inputs also function as a sound switch and its Stereo, so you can connect all your machines to the same pair of speakers, simple simple.

Now for the bad side, i found the image quality lacking, For example the 1280\*1204 resolution that i use in the amiga appears a little smeared, and the Composites have some noise , i was able to remove most of the noise by moing the box away from the monitor and shielding the plugs but the unit it self could be more insulated, well you cant ask for everything considering the unit costs 60 Euro, in my opinion every collector should have one of these, its like an universal Flicker Fixer Scan doubler, i give it a strong thumbs up !!!



Top Picture : The Front of the unit, simple and stylish.

Bottom Picture : The back of the unit, ordered connectors and plenty of inputs.

*Jorge Canelhas*

An Interview with:

# YAREK ADAMSKI

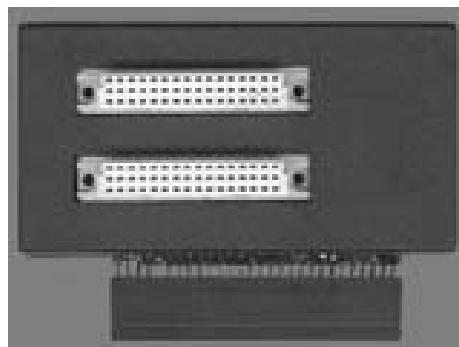
## The YABUS guy !

***YABUS (Yarek bus) is a interfacing system for the ZX Spectrum and compatible computers. It was conceived in the mind of Yarek Adamski (who we are interviewing here), and seems to have all it takes to become a standard in hardware for the speccy. Retro Review wanted to know the man who created it and what's in his mind for the YABUS - so, read on ...***

### 1) Who are you and where are you from? What do you do when not speccing?

I am a fallen angel. (I was a kind of malicious imp, as far I was able to remember.) I came to Earth thousands (or perhaps more) years ago - no idea where from. I still work on my mind to find out. Speccing is my life, so I don't do too many things besides: I study myself (my mind) using a method called Regressing(R) to find the reasons of all the problems I've always had in this World- and I'm a certified regressing therapist. I am also involved in accountancy, but on the computing side, and for several months I've been learning and practising Internet marketing,

I like my financial freedom (own business, real estate, the Exchange, High Yield Investing Programs, etc.). I live with my girl in Gdynia (55N 19E) and often go to my parents (Poddebice, 52N 19E), where



my hardware workbench is.

### 2) Are you a long time Spectrum user ?

Since December 1985, when I saw the ZX Spectrum first time (I was 13 years old). In February 1986 I wrote my first program in BASIC (Euklides algorithm - found in a book as a plain text description). With the ZX Spectrum there was a thick



photocopied book with such mysterious symbols in the appendix as semigraphical squares and "ld bc,nn" - I was curious what this was and how to use them...

### 3) Do you use the Spectrum for 'real' work, or just a hobby ?

As I sell the things I invent and repair hardware, I can say it is real work!

### 4) Please tell our readers what the Spectrum scene is like in Poland.

I think I am close to the scene, but I usually get everything too late. I've seen a lot of very good demos, but several years after they were made. From my experience, I would say that the Spectrum scene in Poland is dormant. Mostly because the people are focussed on earning money and don't have time for other things - it is because of the situation in Poland, not their ill intent.

I know several clever people who told me: "I would like to play with the Spectrum, but I have too much work to do and no spare time". However, the situation is improving.

### 5) Why YABUS? Where did the idea come from ?

YABUS means "YArek BUS". This is a long story! In 1995 I connected a hard disk to my Sam and wanted to connect it also to my Timex FDD 3000 (which I did this year: 2003). I also wanted it connected directly to the ZX Spectrum and a Spectravideo 738 X'PRESS (I have used this extensively since 1988). As the IDE multiplexer was complicated I wanted to make it on a separate board, so I wouldn't need to design a bunch of extension boards with different set of interfaces.

At first the idea of the YABUS was related

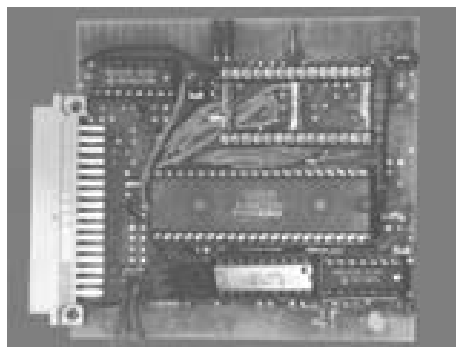
to ZXVGS (and called VGSBUS), as I wanted to use devices under ZXVGS both on Spectrum and Sam and be able to exchange them. As these devices can also be useful for MSX and other non-Spectrums, I changed the name to YABUS (and the name of the modules to YAMOD). I explored a lot of solutions and buses (like S-100, IEC625, ISA etc.) but none of them was as easy as building a device using an universal board and some wires. Most devices can be designed as a one-sided printed circuit board, which makes it easy to produce boards at home - you can build a device module for YABUS (YAMODs) at home as a kit! Also, having a working YAMOD you can connect it to

*[in development is] a board that connects a Spectrum board with a PC AT motherboard*

any computer. Some of the modules are dedicated to the ZX Spectrum, but many others are universal. The idea of the YABUS is to allow the exchange of interfaces between platforms.

### 6) Expansion for the yabus - what exists already? What is planned?

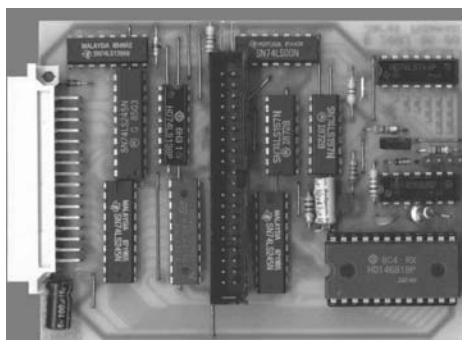
I have a YABUS prototype for my Sam. Also an expansion board for Timex FDD 3000 (the one with big board). I'm now



A YAMOD - the EPROM programmer, in fact. Neat, isn't it?

starting to produce an interface with YABUS slots for the ZX Spectrum (I have a prototype). I also have several other working prototypes (two kinds of IDE, EPROM programmer, a simple I/O port (C=64 IEC compatible, also used to read PC Keyboard), of course AY-3-8910 (that I used with my Sam, blocking the MIDI that is in port conflict). Some next devices are in progress (Kempston Joystick, another EPROM programmer). For some more I have complete documentation and they only need a board design (Kempston Mouse, floppy disk controllers). Some are in design progress (PC Keyboard and Mouse converter for Spectrum and Sam). Also, cheap PCBs are expected next year (5 EUR per piece).

In development are YABUS slots for other computers: Amiga, Amstrad/Schneider, MSX. Also, a board that connects a Spectrum board with PC AT motherboard (ISA of course). The AT 286 boards are good enough to provide cheap I/O interfaces. Also, I would like to define another bus with 24 bits memory addressing (YABUS is only an I/O bus, no memory can be connected). The purpose is to use the eZ80 in place of a Z80 (e.g. in Sam).



**To contact Jarek Adamski use :**

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**7) What do I do if I want to develop YABUS stuff ?**

The YABUS documentation is still unpublished in a good form. I'm working on this and hope to finish it next year.

The best solution is to contact me and ask questions. I can share schematics in Eagle format together with printed circuit board documentation. The idea of YABUS is freeware, along with the designs of my YAMOD devices. This doesn't mean the hardware is freeware as well, but it is very cheap and you can make it yourself!

**8) Anything else you'd like to say to our readers (please remember, many are not Spectrum users!)?**

I would like to say... that I am happy and pleased that I am finally finding my place in this World (which isn't easy for beings that originate outside Earth - "fallen angels" in other words). So, do what you want to do, be sure it is good to you and other people, ask yourself why you do this and don't care what other people say.

Please forgive me that I don't do many things as good as someone else could, and thank you for your attention and support of any kind!

Thanks Jarek for the time you gave us and for your answers- hope you live long and prosper !

*Jorge Canelhas*



## Editorial (continued from page 5)

For another good news, next issue we will offer a lucky subscriber a Retro Machine, one of you will have a bigger smile when he receives his Issue 6 in a larger than normal package :).

Another thing that aggravated this year was the value of Retro Computers, if you see ebay or other popular auction site you'll notice a big drop in prices from some machines, guys, I've seen a SAM go for as low as 58 GBP, with disk drive, 512KB and a bunch of original disks, South american computers are also on the bad side of the road, mint TKs and Czerwennys are staying home because no one would pay 50 USD for them, what can be causing this ? The best shoot ive heard has been the downfall of .com companies and overpaid Computer nerds who gave absurd values for not so rare machines.. But, in my opinion this is the unpredictability of market coming into scene.

Thats all folks

thanks for your support

Jorge Canelhas

# See you next Issue...

